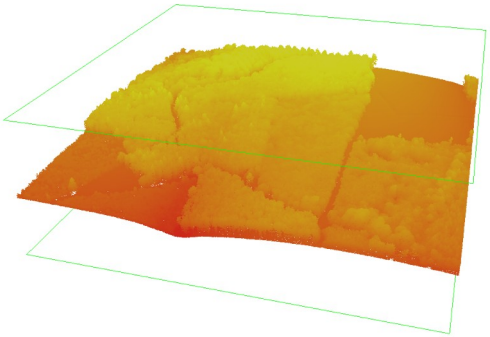
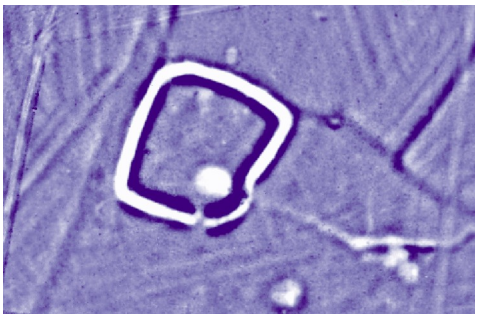
“Advanced Lidar for Historic Environment Professionals”

Information Sheet

CIFA approved 2 day training course



The Environment Agency has been the source of the public lidar data archive for England for over a decade and from 2016 onwards they have made available point cloud data for England. These data provide significant additional information for historic environment and GIS professionals and allow users power over the whole process from point cloud to digital terrain model and beyond. Our advanced lidar course is perfect for those who want to deepen their understanding of how the data can be specified, processed and shared with clients.



Run by professionals with over a decade’s experience in using lidar data for historic landscape analysis, we will cover all the practical and theoretical concepts needed to understand and use lidar point cloud data. You'll use your own laptop and open-source software for the course ensuring that you are fully set up to apply the new skills you've learnt.

What will the course cover?

Over two days we’ll cover the following topics in a series of presentations and practical sessions:

- Introduction to the point cloud – formats and attributes
- Viewing and assessing the quality of point cloud data
- Classifying the point cloud
- Generating terrain and intensity raster
- Generating mask layers
- Viewing the point-cloud with LAStools
- Advanced raster processing in QGIS
- Commissioning lidar survey
- 3D visualisations to share with colleagues and clients

Who is the course aimed at?

The course is aimed primarily at researchers and professionals who want to expand their understanding of the full lidar data processing chain. The course will focus on the processing required to ensure best outcomes for historic environment analysis, however this course will also be open to GIS specialists in other fields.

Course Aim

"To improve your knowledge and understanding of the use of lidar point cloud data."

Course Objectives

1. To provide theoretical background on the use of lidar point cloud data vs. pre-modelled DTM / DSM

2. To provide guidance on on the use of 'raw' lidar data, how to access the Environment Agency LAS archive

3. To provide practical guidance on how to prepare and manipulate point cloud lidar.

4. To provide guidance and discussion on the appropriate use of lidar data and some of the pitfalls / problems that might be encountered

This course provides skills and knowledge in support of the following National Occupational Standards:
AC8 - Undertake analysis and interpretation of archaeological material and data;
AC1- Research and analyse information to achieve objectives
AC2 - Conduct non-intrusive archaeological investigations

The Additional Information section below covers these standards in more detail. I

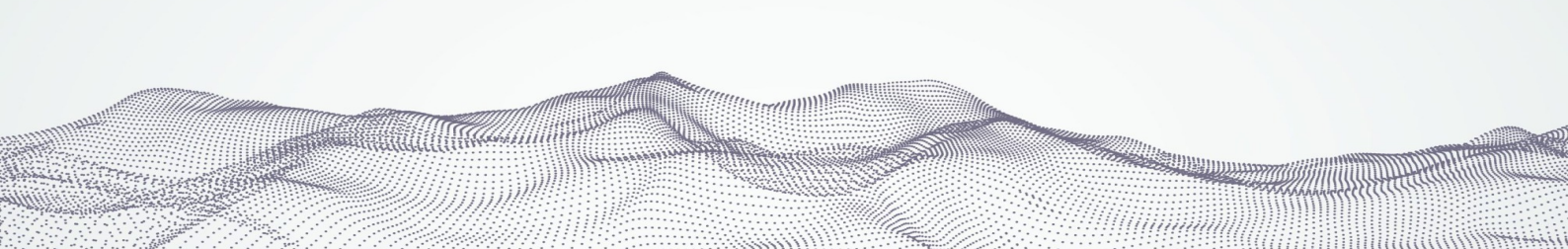
f you are a member of the Association for Geographic Information the two day course counts as 8 CPD points

Why should I attend?

Lidar data can be a tricky resource to get to grips with, even though use of lidar data for a wide range of purposes is now commonplace. However the full potential of this 3D data source is rarely used or taken advantage of by historic environment professionals. What's more, the subtle topography that typifies archaeological remains can be tricky to identify using traditional methods and can be absent entirely from terrain models derived for non-archaeological purposes. In this course, you will be introduced to the awesome world of the point-cloud and learn how to manage your data to best effect.

Cost and Booking Information?

The course is **£600** per participant, including lunch and refreshments,along with dinner at the excellent Lalbagh Indian restaurant on the first evening should you wish to join us. Paypal payment via our website



preferred. Please go to http://www.pushingthesensors.com/booking-form/

Numbers are limited to 8 places so pre-booking is essential and bookings close two weeks before the course date (or earlier if all spaces are filled). If you find that you can't attend we will refund the cost of the course minus an administrative fee of £60 until noon 14 days prior to the course date. Refunds will not be made after this point, but transferring your place to another individual or credit for a future course will be considered where possible.

Requirements

You will need to bring your own laptop and mouse [Windows 8 or newer, Mac OS High Sierra (10.13) or linux with at least 8GB RAM, 1GB memory] with the latest version of QGIS, GRASS, SAGA and LAStools installed (don't worry full instructions on how to do this will be sent out with your welcome pack).

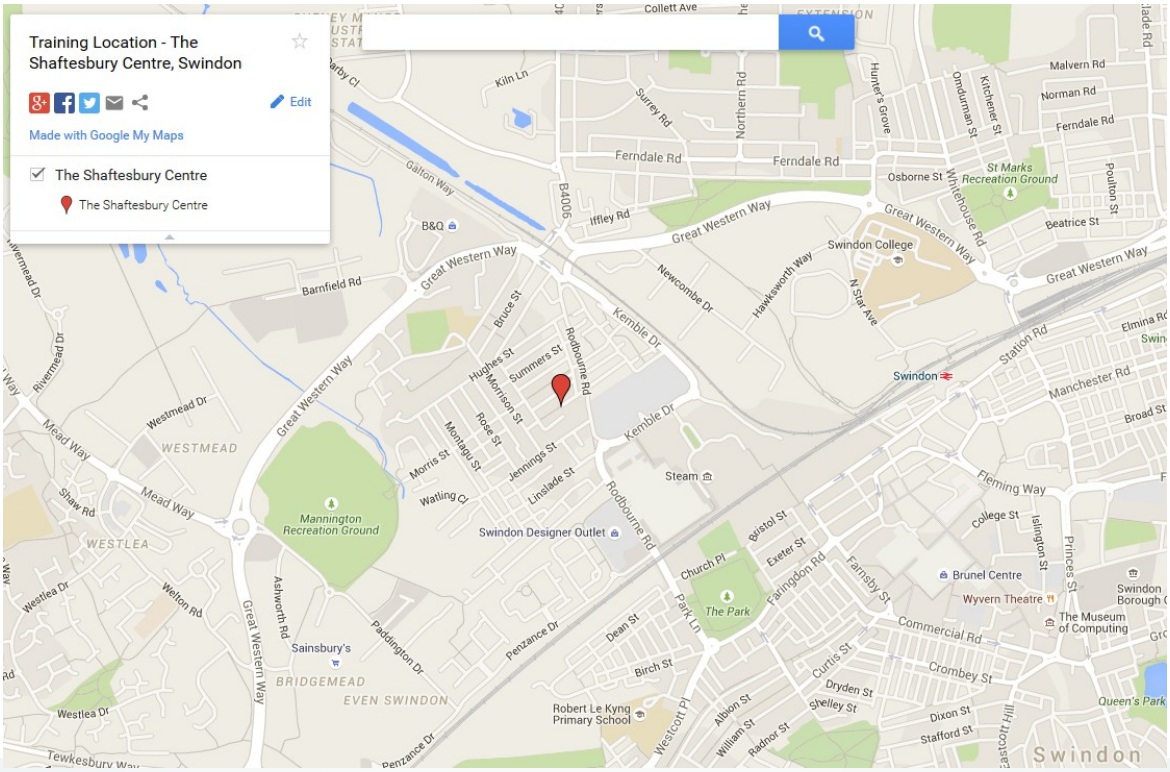
Some previous experience of working with GIS or attendance on the Making the Most of Lidar Course would be an advantage but is not essential.

The Venue

The course will be held at Air Photo Services Ltd, the Shaftesbury Centre, Swindon SN22AZ (within easy reach of Swindon train station). Bus route 5 connects the station to Rodbourne Road and a taxi one-way should be around £7.50.

There is ample free public parking off Morris Street, to the rear of the Shaftesbury Centre building.

The training room is on the second floor with lift access. Please let us know if you will need any specific modifications to make your training day more comfortable.



Travel and Hotel Information

The venue is located 4 miles from junction 15 of the M4 (or 6 miles from junction 16) and within walking distance (20mins) from Swindon town centre and the railway station. Swindon is on the Great Western Bristol-London route, serving London, the Midlands, South West England, the South Coast and South Wales.

If you need to stay overnight there are a range of hotels in Swindon, with the closest to the venue being:

Holiday Inn Express Swindon City Centre, Bridge Street, SN1 1BT
The Great Western Hotel, 73 Station Rd, SN1 1DH
Jurys Inn, Fleming Way, SN1 2NG

Please check online for prices and reviews.

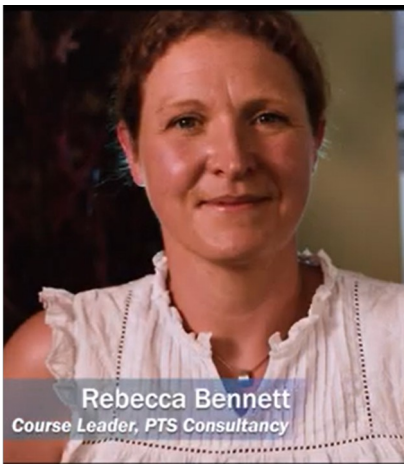
Pre- Course Reading

If you are a super keen bean, you can take a look at the free download from Historic England as a starting point: https://historicengland.org.uk/images-books/publications/using-airborne-lidar-in-archaeological-survey/

You may wish to look at Kokalj and Hesse's 2017, Airborne Laser Scanning Raster Data Visualization: A guide to good practice https://iaps.zrc-sazu.si/sites/default/files/pkc014_kokalj.pdf

Finally Lidar 101: An Introduction to Lidar Technology, Data, and Applications by NOOAA (2012), is a solid introductory text with examples from a broad range of disciplines
https://coast.noaa.gov/digitalcoast/training/lidar-101.html

About the Trainer



Rebecca Bennett is one of the UK's leading researchers in airborne remote sensing including airborne laser scanning (lidar), multi and hyper-spectral imaging for archaeological prospection. Over the last decade she has introduced students and professionals across Europe to the wonders of integrating airborne laser scanned data into their research through the use of open-source software QGIS and GRASS. She is currently collaborating with colleagues across Europe to prepare the EAC Guidelines for the use of Lidar in Heritage Management. You can find out more about her interests and publications at www.pushingthesensors.com

Additional Details - National Occupational Standards Outcomes

This course provides skills and knowledge in support of the following National Occupational Standards for Archaeology (ordered by most relevant first).

AC8	**Undertake analysis and interpretation of archaeological material and data**	P1-5 K1-13	**Performance Criteria** • Accurately identify requirements for analysis and interpretation • Identify and apply relevant technical and ethical standards • Analyse and assess the accuracy, currency and completeness of data and identify any additional data and material requirements • Obtain additional data and material from relevant sources as appropriate • Select, propose and agree appropriate methods for analysis and interpretation **Knowledge and Understanding** • How to carry out analysis and interpretation • Data protocols • Relevant technical and ethical standards • Types of analysis and interpretation • Types of method • How to conduct analysis and interpretation • Sources of specialist information and advice • How to observe and measure accurately • How to adapt analysis and interpretation procedures and practices to suit different conditions • How and where to record and store analysis and interpretation data • Types and modes of analysis and interpretation • Circumstances and conditions which can affect analysis and interpretation activities • Data protocols used in different analysis and interpretation methods
AC1	**Research and analyse information to achieve objectives**	P13-14	**Performance Criteria** • Ensure the methods are appropriate to the type of data and the research aims • Analyse information accurately according to the appropriate methodology
AC2	**Conduct non-intrusive archaeological investigations**	P22-P24	**Performance Criteria** • Verify that data collected during investigation is sufficient for analytical purposes and is collated accurately • Check and verify investigation data for accuracy and integrity • Process investigation data accurately and present it in a format that will assist in making a balanced interpretation